
REMARKS

The Official Action mailed December 14, 2007 has been carefully considered. Claims 1, 3-13 and 15 are pending in the present application and stand rejected. Reconsideration and allowance of the subject application, as amended, are respectfully requested.

Rejections Under 35 USC §103

Claims 1, 5-13 and 15 stand rejected under 35 USC §103 as being unpatentable over Kanai, et al., WO 99/042638 in view of Kucera et al., U.S. Patent Application Publication No.: 2003/0075245.

As an initial matter, claims 1 and 12 are directed to an organosulfur compound comprising at least one compound selected from the group consisting of alkyl thiols, aryl thiols, alkyl-aryl thiols, sulfides, disulfides, thiocarbamates, dithiocarbamates, thiophenols, mercaptopyridines, mercaptoanilines, thiophenes or thiophosphates. It is respectfully asserted that Kanai in view of Kucera fail to teach the organosulfur compounds disclosed herein.

More specifically, as correctly noted in the Office Action of Page 3, “Kanai et al. (‘245 A1) do not teach the claimed organosulfur compounds.” However, the Office Action continues: “[h]owever, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the thiocarbonyl group containing compound of Kanai et al. (‘245 A1) with claimed organosulfur compounds (e.g., thiocarbamates and dithiocarbamates) with expected success, because these compounds are functionally equivalent as disclosed by Kucera et al (‘245 A1) (paragraph [0069], pages 7 and 8). See MPEP §2214.06.”

However, this is not believed to be the case. More specifically, as previously noted Kanai appears to only disclose the use of a thiocarbonyl group-containing compound, which includes compounds such as thiourea. See, *Kanai*, Col. 3, lines 45 through Col. 5, line 40. However, the disclosure of Kanai does not appear to extend from such thiocarbonyl group-containing compounds and limits its disclosure to the use of thiocarbonyl group-containing compounds. Kanai recites that “it is believed that (1) an ion of a thiol group in a thiocarbonyl group containing compound is adsorbed onto an active site on the metal surface such as a zinc surface or an aluminum surface when anticorrosive coatings are applied, whereby exerting the

anticorrosive effect.” Col. 3, lines 52-56 (emphasis added). In addition, Kanai teaches that “a thiocarbonyl compound, especially one having the both atoms simultaneously readily undergoes the formation of a chelate bond on the zinc or aluminum...” Col. 4, lines 7-13.

Accordingly, from the above, one of ordinary skill in the art would conclude from the teaching of Kanai that it would be necessary to incorporate a compound including a thiocarbonyl group, i.e., as illustrated by the formula below,



and that an ion of the thiol group is adsorbed onto an active site on the metal surface and that such compound would undergo a chelate bond on the zinc or aluminum. As such, Kanai’s disclosure starts and stops with thiocarbonyl compounds and critically relies upon the chelating features of such unsaturated functional group with a given metal surface.

The modification of Kanai in view of Kucera does not appear to result in a reasonable expectation of success (see MPEP §2143.02) and does not appear to be functionally equivalent as suggested on page 4 of the Office Action of December 14, 2007. Turning to Kucera, the Office Action of December 14, 2007 references paragraph 0069 which recites:

“As mentioned, the modifying agent can contain other functional groups, e.g., oxygen, nitrogen, non-ionizable sulfur groups, and the like, for example, a nitrogen-containing sulfonate compound such as a sulfonate-amide, -amine, -imine, or -urea compound as illustrated in series FIGS. 9. The modifying agents include aliphatic or aromatic nitrogen-containing compounds which contain an ionic group, wherein nitrogen-containing functional groups provide reactive hydrogen as the reaction enabling moiety. In series FIGS. 9, various sultones are shown in reaction with an aliphatic amide (9-1) with base, and a urea with base (9-5). Guanidine (9-2), thiourea (9-3), or thiosemicarbazide (9-4) react spontaneously with sultones to make sulfonated derivatives. Sultones having 4, 5, 6, 7 or 8 membered rings react analogously to couple with such nitrogen compounds, leaving a remaining phenolic-reactive hydrogen on the nitrogen group. Exemplary known reagents containing amide-, imine-, amine-, urea-, amidine-, guanidine-, semicarbazide-, hydrazide-, thiohydrazide-, thioamide-, thiourea-, thiosemicarbazide-, carbamate-, thiocarbamate-, dithiocarbamate-, and isothioure groups are useful in ring-opening coupling with a sultone to make sulfonated amides, sulfonated imines, sulfonated amines, sulfonated ureas, sulfonated amidines, sulfonated guanidine, sulfonated semicarbazides, sulfonated hydrazides, sulfonated thiohydrazides, sulfonated thioamides, sulfonated thioureas, sulfonated thiosemicarbazides, sulfonated carbamates, sulfonated thiocarbamates, sulfonated dithiocarbamates, and sulfonated isothioureas. Reactions in series 9-3 to 9-5 are made by methods analogous to those in 9-1 and 9-2. Reactions 9-6 utilizes 2-aminoethyl sulfonic acid. Correspondingly an 3-aminopropyl sulfonic acid could be used.

Sulfonic acid structures as shown, are understood to be readily converted to corresponding sulfonate structures.” (Emphasis added).

From the above one may gather that, thiourea and thiocarbamate and dithiocarbamate may be chosen as nitrogen containing moieties in the modifying agent as they enable the modifying agent to react with the phenolic resin precursor. This is supported by the recitation of paragraph [0069], which again recites: “[t]he modifying agents include aliphatic or aromatic nitrogen-containing compounds which contain an ionic group, wherein-nitrogen containing functional groups provide reactive hydrogen as the reaction enabling moiety.” (Emphasis added). This is also supported in paragraph [0041], which recites: “the other important functional moiety in the modifying agent enables the modifying agent to react with the phenolic resin precursor.” (Emphasis added).

However, the disclosure does not enable one to use the thiocarbamate and thiodicarbamate as chelating agents as used in Kanai. Nor does it lead to a reasonable expectation of success given the above recited teaching of Kanai. Once again one would be lead to believe that the unsaturated functional groups recited in Kanai would be necessary.

In addition, rather than utilizing the above nitrogen containing moieties of chelating agents, Kucera recognized an additional need for chelating agents and recited in paragraph [0100]: “[t]he modifying agent also can optionally include a functional moiety that is capable of chelating with a metal ion that is present on the substrate surface on which the phenolic resin dispersion is applied. The chelating group remains as a residual group after the condensation of the phenolic resin precursor and the aromatic modifying agent. Typically, the chelating group is a substituent on the aromatic ring that is capable of forming a 5- or 6- membered chelation structure with a metal ion.”

Accordingly, it is respectfully asserted that Kucera does not teach that one may simply substitute the thiourea taught by Kanai with a thiocarbamate or a dithiocarbamate for use as a chelating agent. Rather, Kucera teaches that such substitutions can be made because the groups are nitrogen containing and the nitrogen containing functional groups provide reactive hydrogen as a reaction enabling moiety. In addition, one would not modify Kanai with the teachings of

Kucera as a reasonable expectation of success is not present given the teaching of Kanai. Thus it is respectfully asserted that the teachings of Kanai in view of Kucera fail to render obvious the presently claimed subject matter of independent claims 1 and 12 and the claims dependent therefrom.

Claims 3 and 4 stand rejected under 35 USC §103(a) as being unpatentable over Kanai, et al. ('245 A1) in view of Kucera et al ('245 A1) and in further view of Thompson et al. (U.S. 4,684,507).

As noted above, a person of ordinary skill in the art would not be led to modify the teaching of Kanai with those of Kucera, as a reasonable expectation of success is not present. Once again, Kucera teaches that thiourea, thiocarbamate and dithiocarbamate may be chosen because they are nitrogen containing moieties in the modifying agent as they enable the modifying agent to react with the phenolic resin precursor. Given the teachings of Kanai, such a substitution or modification would not be successful in "the formation of a chelate bond on the zinc or aluminum [surface]." Once again, the thiocarbamate and dithiocarbamate do not include unsaturated sulfur groups and would not be an appropriate modification to Kanai. As one may not modify the teaching of Kanai with Kucera and obtain a reasonable expectation of success, it is respectfully asserted that the addition of Thompson does not otherwise render obvious the presently claimed invention for the reasons stated in the previous response filed on October 23, 2007, the discussion of which is incorporated by reference herein. Thus it is respectfully asserted that the teachings of the above cited references fail to render obvious the presently claimed subject matter of dependent claims 3 and 4.

Having dealt with all the objections raised by the Examiner, it is respectfully submitted that the present application, as amended, is in condition for allowance. Thus, early allowance is earnestly solicited.

If the Examiner desires personal contact for further disposition of this case, the Examiner is invited to call the undersigned Attorney at 603.668.6560.

AMENDMENT

Serial Number: 10/786,340

Filing Date: February 25, 2004

Title: Method of Improving the Performance of Organic Coatings for Corrosion Resistance

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Docket: YOU101

In the event there are any fees due, please charge them to our Deposit Account No. 50-2121.

Respectfully submitted,

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